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**C**ommunications of the **A**ssociation for **I**nformation **S**ystems

## **OFFSHORING AND ITS IMPLICATIONS FOR THE INFORMATION SYSTEMS DISCIPLINE: WHERE PERCEPTION MEETS REALITY**

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### **ABSTRACT**

The shrinking student numbers in IS programs in developed countries have created a crisis for the IS profession. In this paper, we explore how offshoring is affecting the IS discipline both directly and indirectly and show some of the major causes behind the relocation of IS work. Our primary message is that while offshoring has impacted the location of some IS tasks, this has not led to the demise of the field. Indeed, in contrast to the public conception, the statistics show there are more IS jobs now than ever before in developed countries.

We explore what can be done to better prepare the field for the offshoring challenge and to align the rather negative public perception of the future of the IS field with reality. While simple IS tasks such as coding can be commoditized and are therefore vulnerable to offshoring, other significant pieces of IS work (e.g., business modeling/IS business analysis) are "customer-facing" with high levels of complexity. The latter are less vulnerable to commoditization and consequently less likely to be offshored. We recommend that the academic IS community focuses more on producing these customer-facing IS personnel that organizations will increasingly look for. We offer some suggestions for stakeholder groups in the field to address the key challenges they face.

**Keywords:** outsourcing, offshoring, IS discipline, crisis, recommendations

## I. INTRODUCTION

The declining state of the IS field<sup>1</sup> as manifested in the shrinking IS enrolments in tertiary education constitutes a major crisis for many stakeholders. Even allowing for typically cyclical student numbers in the U.S. and other English-speaking countries (but also to some extent in Europe), we do not see much of an upturn in IS students — an upturn which is much needed for a vibrant IS community.

The crisis seems at least partially driven by the consequences of and the late reaction to IS offshoring<sup>2</sup> and the perception that there are no jobs for our IS graduates. This perception — in our eyes a misperception — has been the start of a vicious circle: It not only directly causes lower student numbers. In turn, the falling enrolments compound the problem shifting it from one of few job opportunities to one of insufficient numbers of IS graduates and forcing companies to go offshore to fill their IS needs [Ives 2005].

*Parents and young people have the impression that all IT jobs are going offshore, but only 2 percent U.S. IT workforce is being offshored currently . . . With fewer young people entering IT and baby boomers reaching retirement age, there's a net shortfall . . . Through necessity we may need to offshore jobs. [Noble, 2007, p. 17]*

In an effort to offer some analyses and propose some solutions for the IS field to overcome the current state, this paper is structured as follows: We next describe IS offshoring and the perception of too few IS jobs as causes for the crisis in the IS discipline. Then we suggest and investigate ways of how the IS discipline and its major stakeholder groups could respond to the crisis. We conclude with a short summary and an outlook to the future.

## II. DRIVERS OF THE CRISIS IN THE IS FIELD

In 2003, Hirschheim and Klein saw, on the one hand, that the IS field had the potential to grow and become one of the most important areas for business since no organization could ignore the inexorable development and application of new information technology and expect to survive. On the other hand, they suggested that the IS field was at a crossroads. Citing Markus [1999], who had asked “What happens if the IS field as we know it goes away?” they argued that the field needed to consider its future as there were ominous, but conflicting signs.

Along those lines, many scholars in the IS community have identified and described a crisis in the field. Several papers have offered explanations for the crisis [e.g., Benbasat and Zmud 1999; Davenport 1999; Markus 1999; Watson et al. 2000; Alter 2003; Hirschheim and Klein 2003; DeSanctis 2003; Sandvig et al. 2005; Hirschheim 2006; Neufeld et al. 2007].

We assume that a good part of the crisis lies in the perception of a lack of IS jobs. As future job market expectations heavily influence the decision to enter a field of study by prospectus students and their parents, the perceived lack of IS jobs might have caused the massive decrease in IS majors (by 50 to 85 percent from 2000 to 2005 with an average drop of 66 percent [Ives 2005]). In response to the decrease in IS majors, many universities no longer support a vigorous and expanding IS group. Several U.S. universities removed the “core” IS course from the MBA program, leading some IS skills to migrate to other business disciplines [Ives et al. 2002]. Many U.S. business school deans have adopted the disturbing belief that IS as a separate field is no longer necessary.<sup>3</sup>

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1 We use the terms *field* and *discipline* interchangeably in this paper.

2 Sometimes referred to as outsourcing overseas or offshore outsourcing.

3 On a slightly more positive side, though, Bradford [2006] revealed that “43 out of 45 U.S. business school deans interviewed believed that it is critical for executives of the future to have a clear understanding of how IS affected business and society.”

But the prospective students' assumption underlying the chain of events may be false; the expectation of a lack in IS job opportunities is mistaken. Recent employment data suggest an abundance of IS jobs in the Western world for the foreseeable future [Aspray et al. 2006; Chabrow 2006a; Holahan 2007]. IS jobs are likely to be among the 10 fastest growing between 2004 and 2014 [U.S. Bureau of Labor Statistics 2005]. IS employment is at an all-time high of 3.472 million [Chabrow 2006b], with IS unemployment being down to 2.5 percent just marginally above the all time low of 2.3 percent in 2001. Nevertheless, the misconception is serious and overwhelming as it overrides job market facts.

We think that a major reason for this misconception is the burgeoning growth of offshoring<sup>4</sup> and its perceived implications on jobs in the IS field. Offshoring has become a centerpiece of the political globalization debate and the ongoing coverage in the press. For instance, in 2003, the business press reported that about 50 percent of IS jobs would be offshored to off- and near-shore destinations in the next 10 years due to the labor cost arbitrage between the developed and the developing nations [Business Week 2003; USA Today 2003]. But what types of IS jobs would be subject to offshoring?

In the IS field, there are two major types of commoditized work currently being offshored or likely to be offshored: information processing activities and information systems services. Information-processing activities relate primarily to transaction- and data-processing projects such as help-desks and call centers and are sometimes referred to as teleworking services. Information systems services are concerned with software development activities: the analysis, design, implementation, and maintenance of information systems.

One could argue that IS is likely to follow the path taken by the textile and automobile parts industries [Harrison and McMillan 2006], where complete production lines or components with perfectly defined interfaces, like tires, seats, and even more complex auto parts such as engines and gearboxes, were offshored [Mann 2005]. In the IS field, simple coding of well-specified programs could be treated as a commodity and sent abroad — similar to commoditized tasks in manufacturing and the textile industries [Carr 2003]. However, for IS software development to resemble assembly lines (so-called software factories), it would have to have clear development specifications.

Alternatively, it could be argued that, instead of following blue collar work such as textile and automobile parts, IS would follow other knowledge work areas such as accounting, HR, and medicine [e.g., Sheshabalaya 2004; Friedman 2005]. To the degree that IS work can be commoditized, this argument is compelling. In many blue and white collar fields, the process of commoditization has been underway for many decades and is most likely irreversible. Firms of all sizes are rushing overseas to have their commoditized work performed by offshore vendors [Sahay et al. 2003; Krishna et al. 2004; Carmel and Tjia 2005].

But, even though information processing and information systems services are potentially suitable to be offshored, much of the remaining IS work, usually demanding contextual knowledge, cannot be codified and digitized [Nicholson and Sahay 2001] and therefore is likely to remain on-site.

Thus the need for customer-specific, contextual knowledge may hinder large-scale offshoring. Many IS tasks require direct proximity to the customer. For instance, IS software development requires clear development specifications which we believe need to be analyzed and constructed

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4 Global IS offshoring, sometimes short for *offshore outsourcing*, with respect to knowledge work is a relatively new phenomenon, which became a workable mainstream strategy in the 1990s when digital information could be transported cheaply and efficiently. IS offshoring refers to the migration of all or part of the development, maintenance and delivery of IS services to a vendor that is located in a country different from that of the client [Dibbern et al. 2004]. Offshoring typically involves the movement of these services to countries like India, China and Eastern Europe where professional wages are significantly lower.

together with the customer on-site. Business modeling and co-designing interfaces with customers requires both domain-specific knowledge and intense interaction with customers. Hence, such IS development work makes physical proximity to customers essential. Such complex, customer-facing activities are intractable to codifying and sending offshore. Customer-facing jobs induce skill requirements moving from traditional programming to (1) business domain knowledge for business process and business event modeling; and (2) more conventional IS analysis and design [Curtis et al. 1992; Melao and Pidd 2000; Heuser 2005; Feldman 2005; Smith and Fingar 2003; Zweg et al. 2006].

Further, the need for local, culture-specific contextual knowledge may inhibit even simple processes from being standardized and offshored in a culturally independent way [WTO, 2005]. However, the requirement of cultural proximity is not per se a reason for IS jobs to stay onshore. To fulfill the cultural proximity requirements, there is evidence that US companies will offshore to Ireland and Israel, Spanish companies offshore to Latin America, and German companies “near-shore” to Eastern Europe [Farrell 2004; Financial Times 2004]. We thus question just how big an impact offshoring will really have on IS jobs. This is not to deny that a considerable number of IS jobs will be offshored, but because of the pervasiveness and growth of IT use in organizations, there is — and will continue to be — a significant on-shore need for IS talent.

### III. HOW SHOULD THE IS DISCIPLINE AND ITS STAKEHOLDERS RESPOND TO THE CRISIS IN THE IS FIELD?

Many colleagues have offered suggestions on how to end the crisis in the IS field [Elliott et al. 2002; Galliers 2003; Ferguson 2004; Agarwal and Lucas 2005; Heuser 2005; Feldman 2005; Markus 2005; George et al. 2005; McGee 2006; Zweg et al. 2006; Abraham et al. 2006; Davis et al. 2006; Cederlund et al. 2007; Looney and Akbulut 2007].

In this section we add to those by offering suggestions to the IS discipline and its main stakeholders, namely, (1) IS faculty; (2) academic IS associations and schools; (3) corporations; and (4) governments and governmental authorities. We focus on responding to a situation which is characterized by a misconception regarding the IS job market and in which commoditized IS tasks such as coding, support, and operations are already being offshored due to labor cost arbitrage and the abundance of quality talent in those offshore locations.

#### IS FACULTY

As protagonists of the discipline, IS faculty need to assist in (1) correcting the public perception that IS is not a good career choice because there are no jobs for our graduates; (2) changing the IS curriculum; and (3) capitalizing on its first-mover academic knowledge of IS offshoring.

***Help in correcting the public perception that IS is not a good career choice because there are no jobs for our graduates.*** The IS field needs to overcome the perception in the heads of prospectus students and their parents that there is a lack of IS jobs. The U.S. Bureau of Labor Statistics [2005] estimates that by 2014 the IS industry will have more than 1.3 million job openings. Therefore, IS faculty need to spread information about the actual situation such as salaries, the number and scope of jobs on offer, and the attractiveness of jobs that span business units. These are persuasive reasons for students to major in IS and thus should serve as marketing arguments that IS faculty need to convey to prospectus students and their parents. IS faculty should consider visiting high schools and talk to freshmen about IS careers. Also, they should be more involved with IS student organizations, supporting recruiting, inviting and encouraging IS guest speakers, and inviting past graduates to speak on campus about their IS careers. In addition, current IS faculty should not underestimate the importance of developing the next generation of faculty. To this end, IS faculty must also tackle the misconception of a fading academic IS job market in the minds of actual and prospective IS Ph.Ds, so that the IS discipline will not suffer from a shortage of Ph.D graduates [George et al. 2005].

**Change the IS curriculum.** Once IS faculty have been successful in attracting students to major in IS, they need to offer attractive content based on an up-to-date curriculum. Changing the IS curriculum needs to better reflect global realities [McGee 2006] and focus more on why technology is valuable to an organization rather than on what the technology is or how it works [George et al. 2005]. The IS curriculum needs to include what McGee [2006] terms *bright shiny objects* as a ubiquitous part of IS programs. Just knowing the value of the technology is not enough to keep the students' attention; it needs to be complemented with knowledge about the technology and how it works — reinforcing and developing concepts for students who have grown up digital [Tapscott 1997]. Curriculum changes to attract students must also consider offshoring-induced modeling requirements in which customer-facing skills (e.g., IS business analysis/process modeling) become more critical.<sup>5</sup> Having dealt extensively with development models, the IS discipline seems particularly well placed to perform such a teaching function. New business process redesign is a logical extension to information requirements analysis, IS design, and implementation. Beyond the content, the way IS faculty convey the content is also important. George et al. [2005] suggest that enthusiastic and entertaining professors and relevant content are key to attracting IS majors in the introductory IS courses and we would support their proposal.

**Capitalize on its first-mover academic knowledge of IS offshoring.** IS offshoring may be the precursor to business process offshoring in many other industries which are just as little prepared. Hence, IS offshoring may give the IS field and thus IS faculty an ostensible first mover advantage which they can readily capitalize on. Taking the lead by teaching students offshoring might be a stepping stone on which the field could build. As an offshoring reference discipline, IS may offer general core offshoring courses, teaching students from other disciplines about the nature and challenges of offshoring. In particular, we could offer courses on managing offshoring relationships. Thus, IS offshoring could strengthen the role of IS departments in schools.

## ACADEMIC IS ASSOCIATIONS AND SCHOOLS

In line with the previous discussion, academic associations need to sponsor academic leadership and endorse the initiation of IS curriculum changes. Taking some suggestions to a larger scale, the IS field represented through associations such as the Association for Information Systems (AIS) has made and needs to make suggestions to adjust courses and degrees focusing more on customer-facing activities [Ferguson 2004]. For instance, the AIS has spearheaded promoting courses and sponsoring competitions that reflect new global, social and technical trends, especially in the area of software development innovations and offshore outsourcing [Markus 2005; [www.aisnet.org/award/awards.asp](http://www.aisnet.org/award/awards.asp)].

Further, publications, Web sites, mailing lists, and blogs encourage publishing and thereby spreading initiatives by individuals or groups. Especially in order to spread the information within the community and to schools, the AIS via its IS faculty members should take advantage of the AIS Web site ([www.aisnet.org](http://www.aisnet.org)), the *AISWorld* mail distribution list, and the various articles in the

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5 Several researchers have made concrete suggestions on how to change the IS curriculum to better reflect the offshoring-induced requirements. King [2004] suggested that the IS curriculum should be revamped so as to focus on three core areas: software interfacing, contract management, and strategic technology assessment. Davis et al. [2006] contended that the IS curriculum should be revised to include offshoring management as a key component, and that new specializations should be added to the curriculum, e.g., offshore infrastructure management, offshore system development management, offshore operations management, and offshore outsourcing management. Cederlund et al. [2007] argued that in IS education, project management skills especially those involving cultural differences between offshore IS vendors and on-shore clients must take center stage. Further, according to Hawking et al. [2001], international aspects (legal, cultural and language, etc.) of offshoring agreements needed to be incorporated in the IS curriculum in addition to strengthening the understanding of contemporary technologies and assessing their application suitability in specific business process contexts.

*Journal of the Association for Information Systems* [e.g., DeSanctis 2003; Galliers 2003; Davis et al. 2006; Hirschheim 2006] and in the *Communications of the Association for Information Systems* [e.g., Lucas 1999; Watson et al. 2000; Ives et al. 2002; Alter 2003; George et al. 2005; Markus 2005; Sandvig et al. 2005; Abraham et al. 2006; Cederlung et al. 2007; Looney and Akbulut 2007; Neufeld et al. 2007]. The AIS should encourage its members to offer further educational articles about IS content.

Schools then need to take steps to implement curriculum changes as some have already done: For instance, driven by the initiatives of a number of IS faculty (e.g., Mary Lacity, Beena George, Natalia Levina, Sirkka Jarvenpaa), schools such as the University of Arizona and MIT have developed and implemented undergraduate and graduate outsourcing courses to convey to business students the myriad issues surrounding outsourcing and offshoring. A combined business process management course by Indiana University and the University of Brandenburg in Germany requires students from both universities to collaborate [McGee 2006]. Another example is at Marquette University where a project management course is taught jointly with a university in India. At the University of St. Thomas, they take their IS students on a field trip to India.

## **CORPORATIONS**

In 2003, according to the U.S. Department of Homeland Security, there were 217,340 H-1B visas granted for foreign specialty workers. Of these, more than 38 percent were for computer-related jobs [WTO 2005]. If these visas are restricted in the future which seems likely for security reasons, then corporations will be squeezed from both directions: by a lack of indigenous IS graduates and an inability to tap into skilled people from overseas [McGee 2006a]. Assuming that corporations require IS talent to become successful, insufficient onshore IS talent would lead employers to search offshore. In any longer term, the perception and certainly the belief that jobs are moving offshore would likely create a hiring vacuum for corporations and ultimately turn originally erroneous perceptions into reality.

Corporations via their public relations departments should try to promote and raise awareness of the number of IS graduates needed by writing articles in major newspapers and magazines touting the number of IS jobs available. Further, corporations should offer a greater number and more attractive internships, which provide an excellent and cost-effective way of 'trying out' prospective hires and at the same time help university IS departments to attract and retain good students. They could also make their IS personnel available to talk to IS student organizations and lecture in classes, talking about careers in IS and covering the importance of IS with regard to many business activities, the involvement of new technologies, and the importance of global interactions. IS personnel may possibly even team teach IS classes. Corporations would gain from the newly achieved familiarity in their recruiting efforts.

## **GOVERNMENTS AND GOVERNMENTAL AUTHORITIES**

In a world where IS skills and technologies are global, western governments cannot do much to prevent the free movement of IS work. In the long run, they will have to accept that all countries enjoy gains from trade by opening up to the global job market. However, governments need to take proactive steps to better prepare the developed nations for trade. They need to target resources at tertiary education establishments to produce the kinds of IS graduates that the internal (national) markets need. For instance, the concern over the few students majoring in the so-called science, technology, engineering and mathematics (STEM) areas in the U.S. [Fender 2006] has led the U.S. government to intervene in all areas of primary, secondary and tertiary education, partially by awarding NSF scholarships in the STEM areas ([www.nsf.gov/pubs/2006/nsf06527/nsf\\_06527.htm](http://www.nsf.gov/pubs/2006/nsf06527/nsf_06527.htm)).

Perhaps, governmental authorities may want to consider IS professionalization.<sup>6</sup> But judged this way, IS cannot claim to be a true profession. Comparing IS and software production with established professions (e.g. law, accounting, medicine) we see no comparable body authorized by the state which has a monopoly of knowledge and which can sanction entry. Software is a universal product that can be built anywhere in the world where IS and expertise reside. Combined with communication technology we can see that (at least superficially) there are few barriers to offshoring activities.<sup>7</sup> The IS discipline is practitioner-based, reliant on experience and expertise. Differing from other fields, IS and in particular IS software development produce software standards and certification (e.g., ISO, CMM) that rarely serve as product quality signals chosen by software companies. In IS, no institution has been authorized by governmental authorities to hold a monopoly of knowledge and control entry sanctions. It is debatable whether professionalization of IS work — especially software development — might help developed countries to control offshore movements. It might hold back western companies from offshoring. It might require that Indian IT specialists, for example, train in the developed countries and thus increase enrolments, but it might also increase the bar and thus the labor cost even more and thus encourage offshoring to complete software development and maintenance activities.

#### IV. SUMMARY AND OUTLOOK

Returning to Blake Ives' original concern that: "Student disinterest appears to be increasingly caused by the perception, rather than the reality, of too few jobs," the reality we found is that the IS industry in developed countries is performing reasonably well, despite what most of the public seems to think. And the demand for IS graduates is buoyant. The irony is that the dearth of graduates in developed countries is forcing recruiters to seek IS staff from abroad. Ultimately, if we don't correct this perception, then we run the risk of being marginalized and eventually, dispersed. It is our belief that organizations cannot be successful without IS talent. If there is no IS talent here, where will they find the talent? Most likely employers will find it in the low-waged eastern and far east countries; but what are the longer-term implications of this? The real concern is that if enough people believe that jobs are moving offshore this will ultimately create a vacuum for the developed nations. And what were originally erroneous perceptions will become the new reality.

Confronted with that irony, our paper outlined suggestions for four major stakeholder groups in the IS field, namely IS faculty, academic IS associations and schools, corporations, and governments and governmental authorities to respond to the crisis and turn the IS field into a vibrant community in spite of or perhaps because of the seemingly irrevocable progress of offshoring in the world. We hope everyone takes up this challenge — sooner rather than later.

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- 6 A profession is a body authorized by the state that controls and polices its area of expertise and — where appropriate over time — redraws its boundaries. It needs to create arenas of jurisdiction, to set out a means of producing appropriately qualified entrants to the profession with respective entry barriers, and to create and maintain a monopoly of professional knowledge. In professions such as accountancy, medicine, and law, there are major barriers to entry and self-regulation is the norm [Larsen 1997; MacDonald 1995; Feagin 1999; Meffe 2001; Newman and Westrup 2005]. Professions led the way when it came to innovations such as offshoring of accounting services, for example.
- 7 But see Sahay et al. [2003] and Nicholson and Sahay [2001] for a discussion of cultural and other impediments to offshoring.



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